

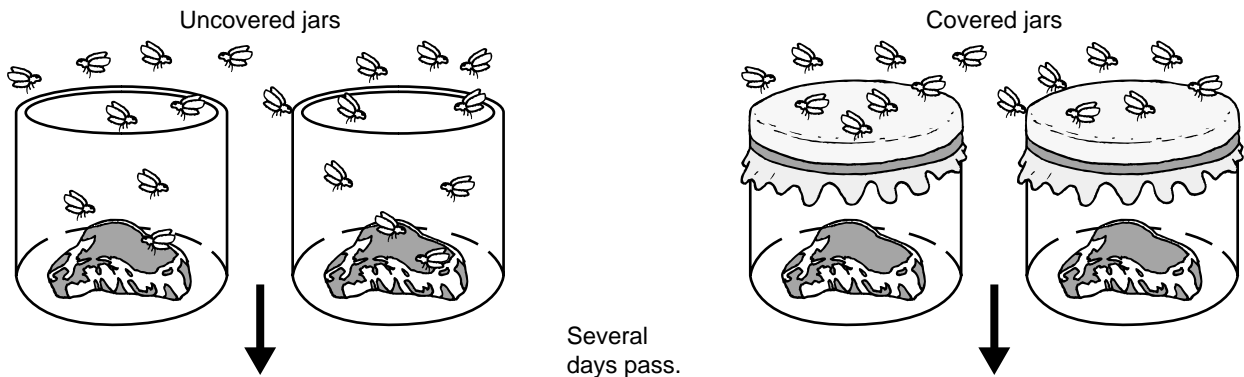
## Section 1–2 How Scientists Work (pages 8–15)

*This section explains how scientists test hypotheses. It also describes how a scientific theory develops.*

### Designing an Experiment (pages 8–10)

1. The idea that life can arise from nonliving matter is called \_\_\_\_\_.
2. What was Francesco Redi's hypothesis about the appearance of maggots?  
\_\_\_\_\_
3. What are variables in an experiment? \_\_\_\_\_
4. Ideally, how many variables should an experiment test at a time? \_\_\_\_\_
5. When a variable is kept unchanged in an experiment, it is said to be \_\_\_\_\_.
6. What is a controlled experiment? \_\_\_\_\_
7. The illustration below shows the beginning of Redi's experiment. Complete the illustration by showing the outcome.

**Redi's Experiment on Spontaneous Generation**



## Chapter 1, The Science of Biology *(continued)*

8. Complete the table about variables.

### VARIABLES

Type of Variable	Definition
Manipulated variable	
Responding variable	

9. In Redi's experiment, what were the manipulated variable and the responding variable?

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10. For what do scientists use the data from a controlled experiment? \_\_\_\_\_

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11. When scientists look for explanations for specific observations, what do they assume about nature? \_\_\_\_\_

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## Publishing and Repeating Investigations (pages 10–13)

12. Why do scientists assume that experimental results can be reproduced?

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13. What did Anton van Leeuwenhoek discover? \_\_\_\_\_

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14. What did John Needham conclude from his test of Redi's findings? \_\_\_\_\_

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15. What did Spallanzani do to improve upon Redi's and Needham's work? \_\_\_\_\_

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16. How did Pasteur settle the spontaneous generation argument? \_\_\_\_\_

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things.

### **When Experiments Are Not Possible** (page 14)

17. In animal field studies, why do scientists usually try to work without making the animals aware that humans are present? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
18. When a controlled experiment is not possible, why do scientists try to identify as many relevant variables as possible? \_\_\_\_\_  
\_\_\_\_\_

### **How a Theory Develops** (pages 14–15)

19. The theory that new organisms come from existing organisms is called \_\_\_\_\_.
20. In science, what is a theory? \_\_\_\_\_  
\_\_\_\_\_
21. Is the following sentence true or false? A theory may be revised or replaced by a more useful explanation. \_\_\_\_\_

#### **Reading Skill Practice**

A flowchart can help you remember the order in which a set of events has occurred or should occur. On a separate sheet of paper, create a flowchart that represents the process that Redi carried out in his investigation of spontaneous generation. This process is explained under the heading *Designing an Experiment* on pages 8–10. For more information about flowcharts, see Organizing Information in Appendix A of your textbook.